

The State of FSEC

James Fenton

Advisory Board Meeting

March 29, 2019



**FSEC Energy
Research Center**

UNIVERSITY OF CENTRAL FLORIDA

FSEC Advisory Board Meeting AGENDA

10:00 a.m.	Welcome and Introductions	Mike Faas, Chair
10:10 a.m.	Approval of October 19, 2018 Meeting Minutes	Mike Faas, Chair
10:15 a.m.	Status of FSEC Programs, Progress on Draft Strategic Plan	Jim Fenton
10:35 a.m.	National, States, and Florida State and Cities Energy Policy	Louis Rotundo Colleen Kettles Kelley Smith Burk
11:05 a.m.	Report of Florida Energy Office Florida' Energy Future (up to 2030)	Jim Fenton
11:30 a.m.	Batteries and Their Applications	Hanko Song, VP of Sales, Microvast North America
12:00p.m.	Lunch (Buffet)	
12:45p.m.	City of Orlando Energy Update Smart Energy Innovation Network (Orlando/OUC/FSEC/NREL/RMI)	Chris Castro
1:05 p.m.	Review and Update of FSEC AB 2014 SWOT Analysis to provide framework for FSEC Strategic Plan for 2019 to 2024	Mike Faas, Jim Fenton
1:50 p.m.	Board Business <ul style="list-style-type: none"> ▪ Date and Agenda for Next PAB Meeting 	Mike Faas, Jim Fenton
2:00 p.m.	Adjournment	

Larry Hufford, A Champion of FSEC

“We’re proud of you, FSEC! As many times as we may try in this blog, we will never be able to repay you for your help in making LifeStyle Homes one of the nation’s leading solar power, energy efficient, home builders. Without your help, we would never have been able to develop our guaranteed HERS 59 LifeStyle SunSmartSM homes or our truly remarkable HERS 0 (zero) LifeStyle Net Zero Energy SunSmart(PV) homes which promise their owners Free Electricity for Life!”

— LifeStyle Homes



In Memory of

Larry Hufford

A champion of FSEC®

who will always be remembered for his
stupendous grin and contagious, positive attitude.

He will be remembered for his nine years
of service on the FSEC Advisory Board,
and for his early adoption and demonstrated
leadership in the construction of
high-performance homes.

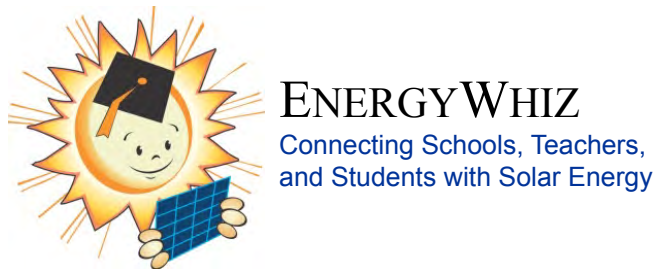
Presented on

March 29, 2019



A Research Institute of the
University of Central Florida

Collaborative Partnerships



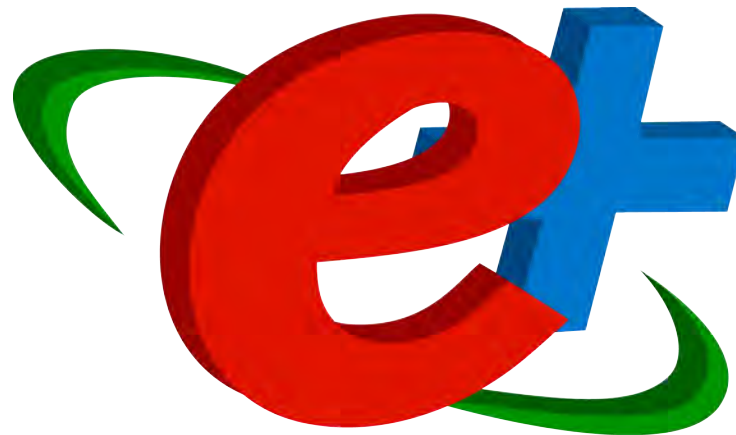
PV, EVs, Energy Efficient Buildings, Load Management, Batteries, Alternative Fuels, Hydrogen, Fuel Cells, Smart Grid Electronics, V2X, Training & Education

New Contracts

U.S. Department of Energy

Continue to develop and support users of the Energy Department's Energy Plus software.

– *Dr. Lixing Gu, Rich Raustad and Dr. Bereket Nigusse*



*Energy***Plus**

New Contracts

Orlando Utility Commission

Evaluate and make recommendations on a number of customer efficiency efforts by evaluating data from current programs, as well as estimating impact from new programs.

– *Rob Vieira, Rich Raustad, Danny Parker and Karen Fenaughty*



New Contracts

U.S. Department of Energy

Market Driven Residential Energy Codes: Comparing Performance in a Changing Technological Environment

– *Philip Fairey, Rob Vieira, Jeff Sonne, Janet McIlvaine*

Partners:

International Code Council (ICC) - *Michelle Britt*

Residential Energy Services Network (RESNET)



New Contracts

U.S. Department of Energy

Investigation of the Prevalence and Energy Impacts of Residential Comfort System Faults – Hot Humid and Hot Dry Climates

- Field data collection effort in 100 homes to quantify prevalence and severity of faults, and lab home evaluation to quantify energy impacts.
 - *Eric Martin, Danny Parker, Chuck Withers, Dave Chasar*

Partners: Proctor Engineering Group

Stakeholders: Air Conditioning Contractors of America, RESNET



New Contracts

National Science Foundation

Belmont Forum Collaborative Research Food-Water-Energy Nexus: Enabling adaptive integration of technology to enhance community resilience.

– *FSEC’s Dr. Lixing Gu and Deputy Director Philip Fairey (two of five UCF research investigators for the project)*

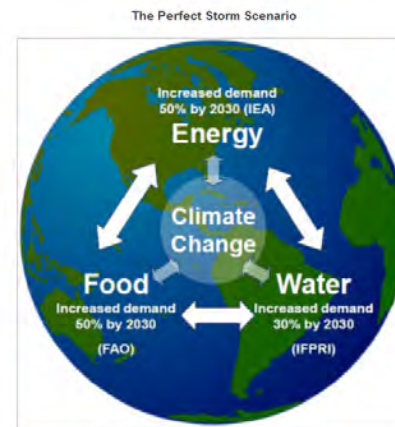


Image Source:
waternexussolutions.org and BIS

New Contracts

State Department of Business and Professional Regulation for the Florida Building Commission

- Residential Attic Performance Comparison Research (Lab)
– *Chuck Withers, PI*
- Quantitative and Economic Analysis of the 7th Edition Florida Building Energy Code (Analysis)
– *Dr. Bereket Nigusse, PI*
- Ducted Dehumidifier Location – Using Dehumidifier as Dedicated Outdoor System (Lab)
– *Chuck Withers, PI*



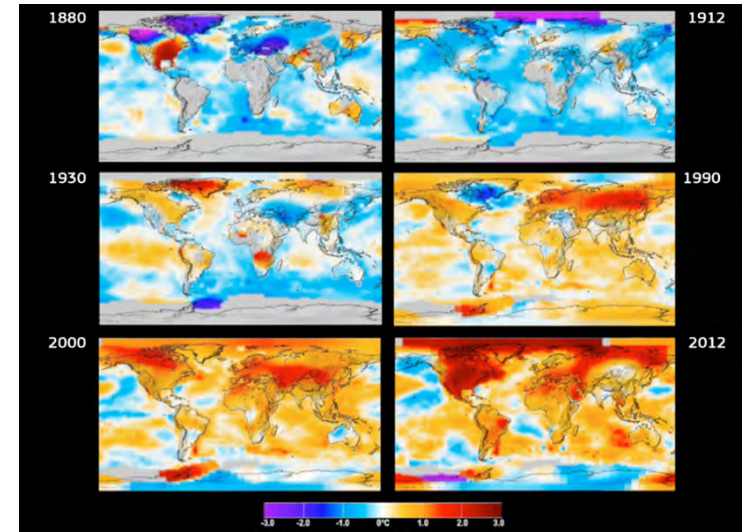
**FLORIDA
BUILDING
COMMISSION**

"STRONGER CODES THROUGH SCIENCE AND CONSENSUS"



International Influence: Focus on Climate Change

- European Commission Joint Research Centre (JRC) and FSEC study
 - Delia D'Agostino (JRC)
 - Danny S. Parker (FSEC)
- Collaborative research study focused on zero energy home economics and energy option sensitivity in a changing climate in 36 European countries.



New Contracts

Department of Energy

Quantifying and Valuing Fundamental Characteristics and Benefits of Floating Photovoltaic Systems

– *John Sherwin*



New Contracts

City of New Smyrna Beach

Energy Efficiency and Solar Feasibility Study

- *Colleen Kettles, Chuck Withers, Karen Fenaughty, Janet McIlvaine, John Sherwin, Donard Metzger, Keith Showalter*



Additional New Contracts

- **ASHRAE** – Add-on to current Building America work to investigate moisture generation in residences.
Eric Martin, Chuck Withers
- **Air Distribution Institute** – Investigate flexible vs. metal duct work energy impacts in residences. *Eric Martin, Chuck Withers*
- **American Chemistry Council** – Continuation of investigating moisture in roof decks of sealed attics. *Eric Martin, Chuck Withers*
- **NYSERDA through LEVY Partnership** – Optimize controls for supplemental mini-split heat pumps for heating applications (*In negotiation*). *Eric Martin, Karen Fenaughty, Danny Parker*



ENGINEERING RESEARCH CENTER FOR ENERGY STORAGE SYSTEM ENABLED SOCIETY (ESSENSE)

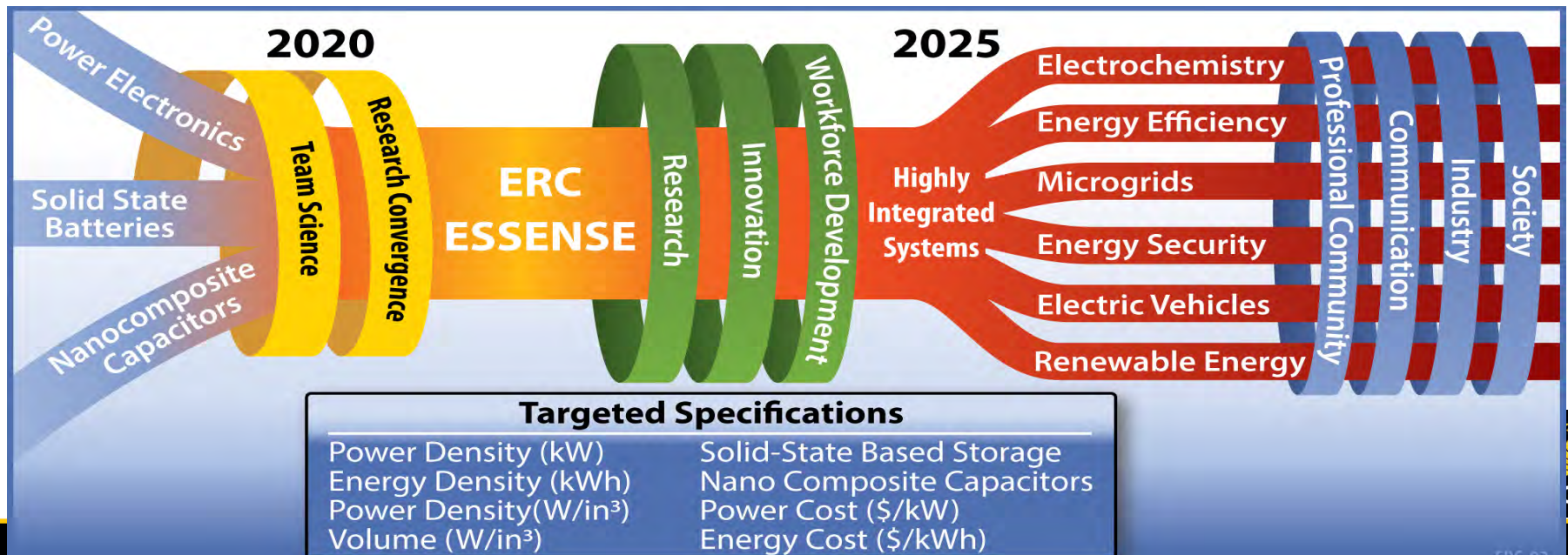
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NSF ERC Planning Grant: One-Year project to develop full proposal under the Engineering Research Center. Total Funds: \$100K

Main Theme: The ESSENSE center will create innovative technological solutions and will lay the foundation for achieving affordable, clean, resilient, and secure electric energy sources to the benefit of society.

ESSENSE will explore the following technical areas:

- (1) Solid State Batteries
- (2) Nanocomposite Capacitors,
- (3) Wide-Band Gap Power Devices
- (4) Integrated Power Electronic and Electric Storage for Grid-tied Application.



UCF Energy Initiative



- Prof. Winston V. Schoenfeld appointed Director
(Also serves as FSEC Director Solar Technologies Research Division)
- Blue-Ribbon Panel
 - 15 members (internal and external)
 - Created January 2018
 - Encompasses FSEC, Facilities, Energy Faculty Clusters (2), Engineering and Science departments
 - Focus: Identify how UCF can create a unified effort to become a leader in Energy Research and Education
 - Panel assembled a 32-page report outlining several recommendations for UCF
- http://www.research.ucf.edu/documents/PDF/UCF_BlueRibbonEnergyPanelFinalReport.pdf

Key Panel Recommendations

- UCF energy community should receive clear vision and direction from UCF leadership
- Create a university-wide coordinating unit around energy
- Evaluate current and future energy-related courses and curriculum
- Market UCF energy research
- Obtain legislative support for a center/institute for research and education in energy and enhanced university/industry research opportunities
- Identify faculty needs in economics and policy needed to integrate energy across campus

**** Panel report details each of these with multiple action items*

Junior Solar Sprint: Connecting Communities with Opportunities for Success



STEM Savvy
Educators

STEM Literate
Citizenry

Sustainable
Infrastructure



Energy Curricula and Learning Kits

- FSEC assembling and distributing kits for Florida Department of Agriculture and Consumer Services, Office of Energy

- **Available for K-12 public schools**

Kits complement the Solar Matters (Grades K-2, 3-5 and 6-8) and Understanding Solar Energy (9-12) activity units developed by the Florida Solar Energy Center.

- **Each kit contains:** wires, motors, milliamp meters, multi-testers, propellers, UV detecting beads, thermometers, prisms, videos, watt meters, reference books, career guides, and various types and sizes of photovoltaic panels.

- **Eligibility**

Applicants must be a Florida public school active with the Master School Identification (MSID) list and the application must be signed by the school's principal. See [the MSID list](#). Kits are limited to one per school. K-12 schools can apply for a kit from each level (elementary, middle and high school) for a total of three kits.

- **Application Process**

Fill out the [Energy Education Kits application form](#). All fields in the application must be complete and the application must be signed by the school's principal. The signature must be original. Submit the complete and signed application to Energy@FreshFromFlorida.com or mail to:

Florida Department of Agriculture and Consumer Services, Office of Energy
Attn: Energy Education Kits
600 S. Calhoun St., Ste. B04
Tallahassee, FL 32399-0001

- **Availability**

Energy education kits are available on a first-come, first-served basis based upon the date and time that a properly completed application is received. ***Distribution starts in August.***

Visit the [Office of Energy's website](#) for current availability.



STEM Education: K-12 Teachers and Students

- **EnergyWhiz Events at FSEC**
 - May 4th, 2019
 - Over 1000 participants expected
 - EnergyWhiz Expos in Boca Raton, Brandon, Tallahassee, Gainesville
- **Student Groups**
 - 4th grade to college level
 - Over 1000 students
- **Teacher Workshops**
 - Solar Schools, Hydrogen, Solar Cookers, Photovoltaics



- **Presentations, Special Events and Other Outreach**
 - STEM focused
 - Over 30,000 students

FSEC Strategic Plan (2019-2024)

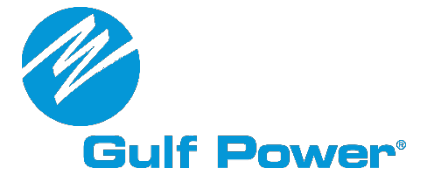
- 2014 FSEC SWOT Analysis & Recent Survey
- Two UCF Energy Clusters
- Buildings & Energy Sustainability Working Advisory Team (SWAT)
- UCF Energy Initiative
- Florida's Energy Future (2025, 2030, 2050)
 - Efficiency, Solar, Energy Storage & EVs

With your help and the above background
FSEC's Strategic Plan will be crafted

Partners



C.T. HSU + ASSOCIATES, P.A.
ARCHITECTURE • PLANNING • INTERIOR DESIGN



Questions?



UCF

**FSEC Energy
Research Center**

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